

REFORMING WET-TANTALUM CAPACITORS IN IMPLANTABLE MEDICAL DEVICES

Abstract of the Disclosure

5 Miniature defibrillators and cardioverters detect abnormal heart rhythms and automatically apply electrical therapy to restore normal heart function. Critical to this function, aluminum-electrolytic capacitors store and deliver life-saving bursts of electric charge to the heart. This type of capacitor requires regular “reform” to preserve its charging efficiency over time. Because reform expends valuable battery energy,

10 manufacturers developed wet-tantalum capacitors, which are generally understood not to require reform. Yet, the present inventors discovered through extensive study that wet-tantalum capacitors exhibit progressively worse charging efficiency over time. Accordingly, to address this problem, the inventors devised unique reform techniques for wet-tantalum capacitors. One exemplary technique entails charging wet-tantalum

15 capacitors to a voltage equal to about 90% of their rated voltage and allowing the charge to dissipate through system leakage for a period of time, before discharging through a non-therapeutic load.